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## **Turkish students' and teachers' attitudes toward the use of interactive whiteboards in EFL classrooms**

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This study explored the attitudes of students and teachers toward the use of interactive whiteboards (IWBs) in a foreign language teaching and learning context. The study also investigated possible factors affecting teachers' and students' attitudes toward IWB technology. Data were collected through questionnaires distributed to 458 students and 82 teachers in different institutions across Turkey, ranging from primary schools to universities. Questionnaire results revealed that both students and teachers have generally positive attitudes toward the use of IWBs in language instruction and are aware of the potential uses of this technology. The statistical analysis revealed that the more teachers use IWBs, the more they like this technology. It was also found that as the number of hours of IWB exposure increases, students' awareness of the distinctiveness of IWB technology increases. Suggestions are made for further research and for administrators considering whether or not to invest in IWBs.

**Keywords:** interactive whiteboards; teacher attitudes; student attitudes; Turkey

### **Introduction**

Over the past several decades, technology has come to play an important role in many areas of education, including second and foreign language instruction. The rapidly increasing use of computer technology and computer-assisted language learning (CALL) has been argued to make language teaching and learning more enjoyable, effective, and versatile (Hall & Higgins, 2005; Levy, 2002). Word processors, websites, email, chat, online tutoring, blogs, podcasts, concordances, and interactive whiteboards (IWBs) are examples of the CALL applications that are now commonly employed by teachers and students. IWBs, originally designed for use in offices, have in recent years begun finding their way into various educational contexts, from primary schools to universities. Although they have become particularly common in the UK and the United States,<sup>1</sup> their use worldwide is growing.

Research reports and studies about attitudes toward and potential uses of IWBs reveal a very positive picture overall. Based primarily on either small-scale classroom studies or reports on IWB use in particular schools or school districts, the research to date has generally found that students and teachers report favorable reactions to

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IWBs (Beauchamp, 2004; Beeland, 2002; Glover & Miller, 2001; Hall & Higgins, 2005; Lee & Boyle, 2004; Levy, 2002; Moss et al., 2007; Smith, 1999; Wall, Higgins, & Smith, 2005). Two similar small-scale studies focusing on IWB use in language classrooms, in particular, also found similar positive attitudes being expressed (Gray, Hagger-Vaughan, Pilkington, & Tomkins, 2005; Schmid, 2006). These and other studies also report on what are seen to be the specific benefits of IWB use in classrooms, by helping young students understand the material better (Martin, 2007; Wall et al., 2005), allowing for introduction of diverse materials into the classroom (Hall & Higgins, 2005; Levy, 2002; Smith, Higgins, Wall, & Miller, 2005), and easing instruction of languages with non-Roman scripts (Tozcu, 2008), to generally helping increase interest and motivation for learning (Bell, 2002; Gray et al., 2005; Harris, 2005; Smith, 2001; Walker, 2002a) and providing alternative modes and levels for interaction (Hauck & Youngs, 2008). Benefits from IWBs have also been cited for teachers. They have been claimed to help teachers be more flexible (Austin, 2003; Kennewell, 2001; Latham, 2002; Levy, 2002; Moss et al., 2007; Walker, 2002b) and efficient (Boyle, 2002; Glover & Miller, 2001; Latham, 2002), to allow teachers to address students' varying needs more easily (Bell, 2002; Billard, 2002; Glover & Miller, 2001), and to provide teachers with the great variety that comes from multimedia use in the classroom (Carson, 2003; Edwards, Hartnell, & Martin, 2002; Johnson, 2002; Morrison, 2003; Thomas, 2003).

While the reported problems and drawbacks of IWBs have been fewer, some have been noted. For the most part, they revolve around either training or practical issues. Training is often found to be inadequate, offered initially to get teachers excited but lacking the in-depth follow-up and support that they need to be able to really make the best use of IWBs (Armstrong et al., 2005; Glover & Miller, 2001; Hall & Higgins, 2005; Levy, 2002). Practical problems include reports of IWBs breaking down or freezing up (Bell, 2001; Hall & Higgins, 2005; Levy, 2002), poor board visibility (Canterbury, 2003; Damcott, Landato, & Marsh, 2000; Smith, 2001), and students or teachers not being able to easily use the board because of its location in the classroom (Tameside MBC, 2003). Concerns have also been raised over possible health and safety risks from the numerous wires that IWBs require or from tripping over the IWB stand's legs (Bell, 2001; Smith, 2001; Tameside MBC, 2003), and over the practicality of IWBs in relation to their high costs (Harris, 2005; Wood, 2001). Of even greater pedagogical concern, perhaps, have been studies suggesting that IWB use may make students more passive by reducing teacher–student interaction (Gray et al., 2005, also questioned in Kennewell, Tanner, Jones, & Beauchamp, 2007) and may lead to more teacher-centered instruction (Goodison, 2003).

While these mixed messages in the general literature remain unresolved, some potential IWB users may be left with even further questions. For institutions considering the extensive costs of installing IWBs in their classrooms, the research has still not yet shown empirically whether the claimed benefits of IWBs are related to unique characteristics of this technology or whether they could be achieved with alternative, perhaps already existing, means. For the teacher of a second or foreign language, many questions remain whether IWBs are equally popular for language instruction specifically, since most research has been made in content classes like math or science. Finally, for people from outside the few countries where most of the research has been conducted, we are also left wondering what exactly is the extent and nature of IWB use in our country or region – does IWB use remain

a phenomenon largely restricted to North America and the UK? How much do the studies conducted in those countries reflect the experiences in the rest of the world, particularly in technologically developing countries? This study attempts to address some of these questions by providing a look at current IWB use in Turkey, focusing particularly on IWB use in English as a foreign language (EFL) classrooms.

### **Methodology**

The study was carried out with 82 EFL teachers and 458 students, in 13 different educational institutions in Turkey (see Table 1 for demographic information). These institutions included primary and secondary schools, universities, and private language schools. The 13 participating institutions constitute a majority of the total population of schools in Turkey in which IWB technology is currently being used for EFL teaching purposes. Two questionnaires, one for teachers and one for students, were employed in this study to collect data about attitudes toward IWBs in language teaching and learning settings. The students' questionnaire was prepared in English, but then translated into Turkish and verified using back-translation. The students were given the Turkish version to ensure their full understanding of the items. The EFL teachers were given their survey in English. Both questionnaires were piloted, and a Cronbach alpha reliability check was conducted on the final versions (student questionnaire 0.79 and teacher questionnaire 0.78). Both questionnaires included five-point Likert-scale items, open-ended, and multiple-choice items.

All Likert scale items in the questionnaires were analyzed using the Statistical Package for Social Sciences (SPSS), and basic descriptive statistics were calculated. For the mean scores and standard deviations, the #3 "neutral/no idea" option was excluded to see only the degree of actual agreement and/or disagreement among the participants expressing a clear opinion. The mean scores ranged therefore from 1.00 to 4.00. Scores between 1.00 and 1.75 were interpreted as the participants showing their strong disagreement with the item, 1.76 and 2.50 indicated disagreement, 2.51 and 3.25 agreement, and 3.26 and 4.00 strong agreement. To find whether there were any significant relations between different variables such as age or hours of IWB use/exposure and participants' attitudes toward IWBs, one-way ANOVA tests were performed.

In addition to the questionnaires as primary data collection tools, interviews were conducted with administrators of three different programs in which IWBs are used, and video-taped observations of several hours of IWB-based classes were made. Resulting data from the interviews and observations were used to support the analyses of the survey data.

### **Results**

The results are presented in two main parts: analysis of the student questionnaires and analysis of the teacher questionnaires. The students' questionnaires were analyzed according to six categories: learning, technical issues, affective factors, motivation, time/organization, and differences between IWBs and traditional whiteboards. The teachers' questionnaires were analyzed according to four categories: teaching, attitudes, motivation, and training. For ease of reading, the questions are renumbered here and run consecutively.

Table 1. Background information on study participants.

Students	Age	F	Percentage	Institution	F	Percentage	English proficiency level (self-reported)		
							F	Percentage	
	6-14	179	39.08	Primary	178	38.86	Elem.	82	17.90
	15-19	175	38.21	Secondary	71	15.50	Pre-Int.	173	37.77
	20-25	93	20.31	University	204	44.54	Int.	147	32.10
	25+	11	2.40	Private	5	1.09	Upp-Int	46	10.04
							Adv.	10	2.18

  

Teachers	Age	F	Percentage	Institution	F	Percentage	Years of teaching experience)		
							F	Percentage	
	20-25	18	21.95	Primary	16	19.51	1-5	42	51.22
	26-30	34	41.46	Secondary	9	10.98	6-10	27	32.93
	31-35	17	20.73	University	44	53.66	11-15	4	4.88
	36-40	4	4.88	Private	13	15.85	16-20	5	6.10
	41-45	5	6.10				21+	4	4.88
	46+	4	4.88						

**Students' attitudes toward the use of IWBs***Students' attitudes related to learning*

Four items in the student questionnaire aimed to investigate the participants' attitudes toward the use of IWBs in terms of their perceived effect on learning. The descriptive statistics in Table 2 show that the students agreed with all of the statements in this category. A majority of the students (69%) agreed that they learn more when their teachers use an IWB in the classroom. A slightly larger percentage (73%) reported that IWB use by their teachers made the lessons easier to understand, and an even higher percentage (81%) attribute this improved understanding specifically to the use of audio and visual materials with IWBs. Recognizing this attribute of IWBs, a majority (69%) agreed that IWBs make it possible for the teacher to bring in and benefit from materials from different sources such as the internet, students' own work, and other software programs.

*Students' attitudes related to technical issues*

Three questionnaire items explored the students' attitudes toward the use of IWBs, specifically in terms of technical issues. The results in Table 3 show a slight contradiction. While 62% of the students agreed that problems with sunlight and screens sometimes prevent them from seeing the images and texts on IWBs, 67% agree that IWBs make it easier for them to see the teachers' drawings and diagrams. Clearly, when the physical conditions are properly controlled, the students find the IWBs useful for displaying graphic material. For the seventh item, a small plurality (41%) disagrees with the idea that frequent technical breakdowns ultimately make IWBs a waste of time, and more than one quarter of the students (26%) report having no idea about this question, which seems to indicate that they had either not faced IWB breakdowns or if they had, that these problems were solved in a short time. Nevertheless, a considerable number of students (33%) agree with this statement, suggesting that the issue of breakdowns and recalibration remains a concern that the developers of this technology need to address.

Table 2. Student attitudes about IWBs and learning.

		SD	D	NI	A	SA	Mean	STD
Q1	F	24	40	78	199	117	3.03	0.89
	Percentage	5.24	8.73	17.03	43.45	25.55		
Q2	F	17	43	62	188	148	3.12	0.90
	Percentage	3.71	9.39	13.54	41.05	32.31		
Q3	F	9	28	50	180	191	3.31	0.81
	Percentage	1.97	6.11	10.92	39.30	41.70		
Q4	F	18	44	78	153	165	3.22	0.85
	Percentage	3.93	9.61	17.03	33.41	36.03		

Notes: F = frequency, SD = strongly disagree, D = disagree, NI = no idea, A = agree, SA = strongly agree; STD = standard deviation.

Q1: I learn more when my teacher uses the IWB.

Q2: It is easier to understand the lesson when my teacher uses an IWB.

Q3: Using audio and visual materials with IWBs helps me understand the lesson better.

Q4: I find the opportunity to learn from different sources with the use of IWBs.

*Students' attitudes related to affective factors*

Five questions on the survey were related to the students' overall feelings and emotions about the use of IWBs in language classes (see Table 4). On the whole, the results showed the students like IWBs and feel confident and comfortable using them. Responses to the two "negative" questions (Q9 and Q11) revealed that approximately two thirds of the students disagreed with the ideas that IWBs are difficult to use or that they feel uncomfortable having their work shown to the whole class on an IWB. On the positively worded questions, a small majority of the students agreed that they like using the IWB in front of the class (Q8) and two thirds agreed in their overall preference for IWB-based lessons (Q10). Results for Q8 were quite interesting, as even though slightly more than half of the students expressed the opinion that they like using the IWB, a considerable number of the students (25%) expressed no idea, suggesting that they probably had not experienced using the IWBs themselves. Such an assumption was supported in the classroom observations, in which only very limited examples were seen of students being asked to come up and

Table 3. Students' attitudes related to technical issues.

		SD	D	NI	A	SA	Mean	STD
Q5	F	19	57	74	160	148	3.03	1.00
	Percentage	4.15	12.45	16.16	34.93	32.31		
Q6	F	60	69	45	156	128	2.85	1.02
	Percentage	13.10	15.07	9.83	34.06	27.95		
Q7	F	102	88	117	94	57	2.31	1.07
	Percentage	22.27	19.21	25.55	20.52	12.45		

Notes: F = frequency, SD = strongly disagree, D = disagree; NI = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q5: IWBs make the teachers' drawings and diagrams easier to see.

Q6: Sometimes deficiencies of the IWB screen and sunlight in the classroom make it difficult to see the things on the IWB.

Q7: IWBs often break down and recalibration causes a waste of time.

Table 4. Students' attitudes related to affective factors.

		SD	D	NI	A	SA	Mean	STD
Q8	F	46	46	116	95	155	3.05	1.06
	Percentage	10.04	10.04	25.33	20.74	33.84		
Q9	F	188	114	85	36	35	1.78	0.97
	Percentage	41.05	24.89	18.56	7.86	7.64		
Q10	F	27	42	84	130	175	3.21	0.91
	Percentage	5.90	9.17	18.34	28.38	38.21		
Q11	F	170	107	95	52	34	1.87	0.99
	Percentage	37.12	23.36	20.74	11.35	7.42		

Notes: F = frequency, SD = strongly disagree, D = disagree, NI = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q8: I like going to the front of the class to use the IWB.

Q9: It seems difficult for me to use IWBs.

Q10: I prefer lessons that are taught with an IWB.

Q11: It makes me uncomfortable when my work is shown to the whole class on the IWB.

use the IWB themselves. Although this is generally considered in the literature as inappropriate use of this technology, it is not terribly surprising to find that teachers in classes with perhaps 25–30 students find it difficult to have the students use the IWB themselves.

#### *Students' attitudes related to motivational issues*

Four questions looked at students' attitudes related to motivational features deriving from the use of IWBs. The mean scores on Table 5 indicate that the majority of students agreed with all the statements, and thus reported finding IWB use motivational in one way or another. Sixty-two percent of the participants believe that they concentrate better when an IWB is used in lessons, and 63% agreed that IWB use makes it easier for them to be motivated. Somewhat smaller majorities agreed that they participate in IWB-based lessons more than in traditional lessons (58%) and that IWB use increases their attention span (57%). The results on whether IWBs make it easier for students to pay attention not only had the smallest percentage of students agreeing, but also had the largest percentage of students reporting that they had no idea (26%). Since this is an opinion question and not about practices (which students may genuinely not have any idea about), it is likely that these students were expressing more of a neutral attitude to the statement rather than reflecting insufficient experience to express an idea.

#### *Students' attitudes related to time management and organizational issues*

Three questionnaire items looked specifically at issues of time management and lesson organization. As is seen in Table 6, the students' responses were again positive, with the mean scores showing agreement with the 19th and 18th items, and disagreement with the negatively worded Q17. The results of Q18 show that 66% of the students believe that, when IWBs are used in the lessons, the lessons become

Table 5. Students' attitudes related to motivational issues.

		SD	D	NI	A	SA	Mean	STD
Q12	F	26	53	94	167	118	3.04	0.87
	Percentage	5.68	11.57	20.52	36.46	25.76		
Q13	F	30	65	99	149	115	2.97	0.91
	Percentage	6.55	14.19	21.62	32.53	25.11		
Q14	F	20	25	47	183	183	3.29	0.79
	Percentage	4.37	5.46	10.26	39.96	39.96		
Q15	F	27	51	121	158	101	2.94	0.94
	Percentage	5.90	11.14	26.42	34.50	22.05		
Q16	F	13	55	98	189	103	2.99	0.88
	Percentage	2.84	12.01	21.40	41.27	22.49		

Notes: F = frequency, SD = strongly disagree, D = disagree, NI = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q12: I concentrate better when my teacher uses an IWB.

Q13: I participate in lessons more when my teacher uses an IWB.

Q14: IWBs make learning more interesting and exciting.

Q15: It is easier to keep my attention when an IWB is used during the lesson.

Q16: Use of an IWB makes it easier for me to be motivated during the lesson.



more organized, and two thirds of the participants also agreed that IWB use saves time – presumably a good thing for teachers and students alike. On Q17, 58% of the students feel that they can keep up with the pace of lessons in which IWBs are used.

#### *Students' attitudes related to the difference between traditional boards and IWBs*

Two questions were asked to directly investigate whether students feel there are significant differences between traditional whiteboards and IWBs (see Table 7). In both cases, the students reported feeling that there are differences, but the results are somewhat mixed. On the more general question of whether or not there is a difference, 59% reported that there is (by disagreeing with a negative statement), but a substantial number (27%) reported that there is no difference. Turning to the more specific question of whether they saw a difference in their teachers' teaching practices depending on whether they were using an IWB or a regular whiteboard, the responses were even more mixed, with just 42% stating there is a difference, one third (33%) stating there is not, and nearly one quarter (24%) expressing a neutral expression of "no idea."

#### *Factors affecting student attitudes toward IWB use*

To see whether it was possible to identify particular variables that might be affecting students' opinions about IWBs, a series of one-way ANOVA tests were performed.

Table 6. Students' attitudes related to time management and organizational issues.

		SD	D	NI	A	SA	Mean	STD
Q17	F	113	154	92	60	39	2.05	0.97
	Percentage	24.67	33.62	20.09	13.10	8.52		
Q18	F	14	44	95	187	118	3.13	0.77
	Percentage	3.06	9.61	20.74	40.83	25.76		
Q19	F	29	39	75	176	139	3.10	0.88
	Percentage	6.33	8.52	16.38	38.43	30.35		

Notes: F = frequency, SD = strongly disagree, D = disagree, NI = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q17: When my teacher uses an IWB, I cannot keep up with the lesson because the pace is much faster.

Q18: The lessons become more organized when an IWB is used.

Q19: Using an IWB saves time.

Table 7. Students' attitudes related to the difference between traditional boards and IWBs.

		SD	D	NI	A	SA	Mean	STD
Q20	F	85	108	112	99	54	2.32	1.05
	Percentage	18.56	23.58	24.45	21.62	11.79		
Q21	F	140	131	61	69	57	2.10	1.05
	Percentage	30.57	28.60	13.32	15.07	12.45		

Notes: F = frequency, SD = strongly disagree, D = disagree, NI = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q20: There is no difference between my teacher's use of a traditional board and an IWB in terms of teaching techniques and methods.

Q21: There is *not* much difference between an IWB and a normal whiteboard.

These analyses grouped the students according to certain characteristics, namely, age, gender, type of institution of study (middle school, high school, private language school, and university), and hours of IWB exposure, and investigated whether there were differences among groupings in terms of mean responses to key questions about IWB use. These key questions were selected to explore both general feelings about IWBs and students' opinions about their effectiveness for learning. The groups were therefore analyzed on the basis of their average responses to Q10 (I prefer lessons that are taught with an IWB), Q12 (I concentrate better when my teacher uses an IWB), Q1 (I learn more when my teacher uses the IWB), and Q21 (I think there is not much difference between an IWB and a normal whiteboard). From all of these, only one significant relationship was found, and that was between hours of exposure weekly and awareness of the distinctiveness of IWBs (see Table 8).

Table 8 reveals a significant relationship between the length of students' IWB exposure and their reported belief in the distinctiveness of IWBs from traditional whiteboards. As shown by the post-hoc tests in Table 9, the group with the least exposure to IWBs (1–2 hours) is significantly less likely to report a difference than students who have had at least six hours or more of exposure per week. For students in either of the middle groups (3–5 or 6–10 hours), the significant differences are only found with the two extreme groups (most exposure or least exposure, respectively). Overall, the result can be interpreted that as the hours of IWB-based lessons increase, the degree of recognizing a difference between IWBs and traditional whiteboards rises as well.

### *Teachers' attitudes toward the use of IWBs*

#### *Teachers' attitudes related to IWBs as teaching tools*

Nine questions in the teachers' questionnaire investigated teachers' attitudes toward the use of IWBs as teaching tools (see Table 10).

According to the mean scores, excepting the statement that using IWBs requires more preparation time, the teachers agreed with all the items. The highest mean score belongs to Q7, which indicates that nearly all of the teachers (90%) agree or strongly agree that IWBs can be a good supplement for the language teaching process. Strong agreement can also be seen on the ideas that IWBs make it easier for teachers to review, re-explain, and summarize subjects (85%), and IWBs make it

Table 8. ANOVA results for student IWB exposure and awareness of distinction between IWBs and traditional whiteboards.

		Hours	Q21			
N	Valid	458	458			
	Missing	0	0			
Mean		2.23	2.5022			
Std. deviation		1.083	1.38332			
		Sum of Squares	df	Mean square	F	Sig.
Q21	Between groups	41.760	3	13.920	7.589	0.000
	Within groups	832.738	454	1.834		
	Total	874.498	457			

Table 9. Post hoc results for IWB exposure and awareness of difference.

	(I) Hours	(J) Hours	Mean dif. (I-J)	Std. error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Tukey HSD	1-2	3-5	0.2222	0.13496	0.354	-0.1260	0.5704
		6-10	0.4663(*)	0.13349	0.003	0.01219	0.8107
		11 and above	0.6737(*)	0.16098	0.000	0.2584	1.0890
	3-5	1-2	-0.2222	0.13496	0.354	-0.5704	0.1260
		6-10	0.2441	0.14275	0.320	-0.1242	0.6124
		11 and above	0.4515(*)	0.16874	0.039	0.0162	0.8869
	6-10	1-2	-0.4663(*)	0.13349	0.003	-0.8107	-0.1219
		3-5	-0.2441	0.14275	0.320	-0.6124	0.1242
		11 and above	0.2074	0.16756	0.603	-0.2249	0.6397
	11 and above	1-2	-0.6737(*)	0.16098	0.000	-1.0890	-0.2584
		3-5	-0.4515(*)	0.16874	0.039	-0.8869	-0.0162
		6-10	-0.2074	0.16756	0.603	-0.6397	0.2249

Note: \*The mean difference is significant at the 0.05 level.

Table 10. Teachers' attitudes in terms of teaching.

		SD	D	NI	A	SA	Mean	STD
Q1	F	4	7	7	36	28	3.17	0.81
	Percentage	4.88	8.54	8.54	43.90	34.15		
Q2	F	8	40	8	18	8	2.35	0.82
	Percentage	9.76	48.78	9.76	21.95	9.76		
Q3	F	1	4	8	30	39	3.45	0.67
	Percentage	1.22	4.88	9.76	36.59	47.56		
Q4	F	1	7	14	34	26	3.25	0.70
	Percentage	1.22	8.54	17.07	41.46	31.71		
Q5	F	1	9	13	35	24	3.19	0.71
	Percentage	1.22	10.98	15.85	42.68	29.27		
Q6	F	2	8	13	37	22	3.14	0.73
	Percentage	2.44	9.76	15.85	45.12	26.83		
Q7	F	0	1	7	33	41	3.53	0.53
	Percentage	0.00	1.22	8.54	40.24	50.00		
Q8	F	5	9	16	28	24	3.08	0.90
	Percentage	6.10	10.98	19.51	34.15	29.27		
Q9	F	0	6	6	32	38	3.42	0.64
	Percentage	0.00	7.32	7.32	39.02	46.34		

Notes: F = frequency, SD = strongly disagree, D = disagree, NI = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q1: Using the IWB resources reduces the time I spend writing on the board.

Q2: When using IWBs in the classroom, I spend more time for the preparation of the lesson.

Q3: Using IWBs makes it easier to reach different sources and display them to the whole class immediately.

Q4: IWBs are beneficial for saving and printing the materials generated during the lesson.

Q5: I can give explanations more effectively with the use of IWBs.

Q6: With the help of using the IWB, I can easily control the whole class.

Q7: I think IWBs can be a good supplement to support teaching.

Q8: Using IWBs makes me a more efficient teacher.

Q9: Using IWBs makes it easier for a teacher to review, re-explain, and summarize the subject.

easier to reach different sources and display them to the class (84%). Teachers also agreed with several other commonly noted benefits of IWB use, such as their reducing the time teachers spend writing on the board, allowing teachers to save and print materials generated in class, helping teachers explain things more effectively, and making it easier for teachers to control the class. For the most part, teachers also reported feeling that IWBs made them more efficient teachers (63%). It is not entirely clear whether these benefits come at a cost to teachers' preparation time, as the teachers' reports were somewhat mixed on whether IWBs required more time from them to get ready for class. While a small majority (58%) felt that IWBs did not require any extra time, a significant group (32%) felt that they did.

#### *Teachers' general attitudes toward the use of IWBs*

The teachers' positive attitudes continued when asked about their general attitudes toward IWBs, their personal comfort with using them, and their thoughts on this technology's overall role in the classroom (see Table 11).

In terms of mean scores, the teachers strongly agreed with Q10 and Q12 while they disagreed or strongly disagreed with the rest of the questions in this category. Since these remaining questions were actually expressing negative opinions, the teachers' disagreement reveals their overall positive attitude, and thus a consistency among their responses. Clearly there is broad positive consensus on IWB use. Teachers like using IWBs (83%) and feel comfortable using them (71%). They reject the ideas that their students are in any way not ready to use them (80%) or that they themselves are not somehow able to use them (87%).

Table 11. Teachers' general attitudes toward the use of IWBs.

		SD	D	NI	A	SA	Mean	STD
Q10	F	2	5	7	31	37	3.37	0.73
	Percentage	2.44	6.10	8.54	37.80	45.12		
Q11	F	33	26	9	8	6	1.82	0.93
	Percentage	40.24	31.71	10.98	9.76	7.32		
Q12	F	1	5	11	38	27	3.28	0.66
	Percentage	1.22	6.10	13.41	46.34	32.93		
Q13	F	37	27	13	4	1	1.55	0.68
	Percentage	45.12	32.93	15.85	4.88	1.22		
Q14	F	41	25	6	8	2	1.62	0.78
	Percentage	50.00	30.49	7.32	9.76	2.44		
Q15	F	20	31	10	17	4	2.07	0.86
	Percentage	24.39	37.80	12.20	20.73	4.88		
Q16	F	45	27	4	4	2	1.53	0.72
	Percentage	54.88	32.93	4.88	4.88	2.44		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q10: I like using IWB technology in my lessons.

Q11: I feel uncomfortable using IWBs in front of my students.

Q12: I have positive attitudes toward the use of IWBs in language instruction.

Q13: I have negative attitudes toward the use of IWBs in language instruction.

Q14: I do not think my students are ready for this technology.

Q15: What I do in class with traditional methods is sufficient for teaching English.

Q16: I am not the type to do well with IWB-based applications.

*Teachers' attitudes in terms of motivational issues*

The teachers were also consistent in their attitudes that IWBs are a good teaching tool for motivating students, as shown by the high mean scores and low standard deviations for all the statements in this category (see Table 12). A large majority of the teachers (87%) agreed that IWBs make lessons more enjoyable and interesting. Almost as many (78%) agreed that the use of IWBs increases student interaction and participation and makes it easier to keep the students interested in the lesson. Seventy-two per cent of the teachers believe that their students are more motivated when an IWB is used in the classroom.

*Teachers' attitudes related to the issue of training*

Two questions addressed the specific issue of training for the use of IWBs: whether it is necessary and whether without it, they still feel comfortable using IWBs (see Table 13).

The mean scores calculated indicate that the teachers believe in the need for training, but are much more divided over whether such training is absolutely necessary for them to feel comfortable using IWBs. Sixty-three per cent of the participants agreed in Q21 that training is necessary for the use of this technology.

Table 12. Teachers' attitudes in terms of motivational issues.

		SD	D	NI	A	SA	Mean	STD
Q17	F	1	3	6	32	40	3.46	0.64
	Percentage	1.22	3.66	7.32	39.02	48.78		
Q18	F	3	4	11	40	24	3.20	0.73
	Percentage	3.66	4.88	13.41	48.78	29.27		
Q19	F	1	7	9	39	26	3.23	0.68
	Percentage	1.22	8.54	10.98	47.56	31.71		
Q20	F	1	9	13	32	27	3.23	0.73
	Percentage	1.22	10.98	15.85	39.02	32.93		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q17: I think IWBs make learning more enjoyable and more interesting.

Q18: I can keep my students' attention longer with the help of IWB technology.

Q19: I think IWBs increase the interaction and participation of the students.

Q20: I think my students are more motivated when I use an IWB in my lessons.

Table 13. Teachers' attitudes related to training.

		SD	D	NI	A	SA	Mean	STD
Q21	F	1	12	17	34	18	3.06	0.73
	Percentage	1.22	14.63	20.73	41.46	21.95		
Q22	F	5	23	12	30	12	2.70	0.84
	Percentage	6.10	28.05	14.63	36.59	14.63		

Notes: F = frequency, SD = strongly disagree, D = disagree, N = no idea, A = agree, SA = strongly agree, STD = standard deviation.

Q21: I believe that training is required to teach with IWB technology.

Q22: If I do not get sufficient training, I do not feel comfortable with using IWBs in the classroom.

For Q22, however, there is a more mixed response. Although 34% of the EFL teachers report that they feel comfortable without any training while using an IWB, 51% of the respondents agreed that they feel uncomfortable, if they do not get sufficient training. Since the agreement score is higher than the disagreement rate, it can be said that the need for training is accepted as a relatively important issue.

### *Factors affecting teachers' attitudes toward IWB use*

As with the students' questionnaires, various characteristics of the participating teachers were also considered to see whether they might have some bearing on the participants' tendencies to feel positively or negatively toward IWBs. One-way ANOVA tests were performed to explore the relation between teacher attitudes and the variables of age, gender, years of teaching experience, and hours of IWB use. The key questions used to measure their overall attitudes toward IWB use were Q10 (I like using IWB technology in my lessons), Q12 (I have positive attitudes toward the use of IWBs in language instruction), and Q15 (What I do in class with traditional methods is sufficient in teaching English). As with the students, only one relationship between a particular characteristic and a particular attitude was found to be significant: that between hours of actual IWB use and liking the use of IWB technology.

The result in Table 14 shows that there is a significant relationship between the hours of the teachers' IWB use and the degree of liking the use of IWBs. Specifically, post-hoc tests (Table 15) reveal a significant difference between the group with the lowest exposure (one to two hours) and the group with the highest exposure (11+ hours). In general, what this suggests is that as the number of hours of using IWBs increases, teachers' rating of how much they like using this technology increases as well. This is an important finding because it suggests that even if teachers are cautious about using IWBs at first, as they explore their use day by day, they like using them more and more. This finding runs directly counter to the risk one may run with new technology, that the initial response is positive, but when the early excitement wears off, so does interest in using it. It appears that the value of IWBs may become even more evident with further use and exposure – a finding reflected as well in the students' responses.

### **Discussion of the results**

In this study, a broad range of English as a foreign language students and teachers from around Turkey and from different types of institutions (primary schools to universities) were surveyed to learn their opinions and attitudes about the use of IWBs in the language classroom. Keeping in mind that previous studies of teachers'

Table 14. ANOVA results for teachers' IWB use and attitude toward IWBs.

		Sum of squares	<i>df</i>	Mean square	F	Sig.
Q10	Between groups	19.183	3	6.394	8.254	0.000
	Within groups	60.427	78	.775		
	<i>Total</i>	<i>79.610</i>	<i>81</i>			

Notes: The number of hours of using IWBs.

Q10: I like using IWB technology in my lessons.

Table 15. Post hoc results for teachers' IWB use and attitude toward IWBs.

	(I) Hours	(J) Hours	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Tukey HSD	1-2	3-5	-0.5833	0.25150	0.103	-1.2450	0.0784
		6-10	-.06667	0.28676	0.102	-1.4211	0.0878
		11 and above	-0.7613(*)	0.19393	0.001	-1.2715	-0.2510
	3-5	1-2	0.5833	0.25150	0.103	-0.0784	1.2450
		6-10	-0.0833	0.30803	0.993	-0.8937	0.7271
		11 and above	-0.1779	0.22419	0.857	-0.7678	0.4119
	6-10	1-2	0.6667	0.28676	0.102	-0.0878	1.4211
		3-5	0.0833	0.30803	0.993	-0.7271	0.8937
		11 and above	-0.0946	0.26313	0.984	-0.7869	0.5977
	11 and above	1-2	0.7613(*)	0.19393	0.001	0.2510	1.2715
		3-5	0.1779	0.22419	0.857	-0.4119	0.7678
		6-10	0.0946	0.26313	0.984	-0.5977	0.7869

Note: \*The mean difference is significant at the 0.05 level.

and/or students' attitudes toward IWB use were generally conducted in individual classes or schools, in Western English-speaking countries, and in "content" rather than language-learning classes, it is interesting to see that, in large part, the findings of this investigation are consistent with those of earlier studies.

Turkish EFL students and teachers alike reported overall positive attitudes toward this new technology. They like and feel comfortable using it, and believe that it is a beneficial teaching tool. For the teachers, it was noteworthy that their appreciation of IWBs increased the more they used them. As in earlier studies, both the teachers and students in this study find in particular that the capacity to easily and spontaneously incorporate audio and visual materials into the lesson is a useful one that aids student understanding of the material and also serves to keep students more attentive. While students find this capacity makes classes more interesting, teachers like the flexibility it provides them. The degree of student and teacher agreement on this point is impressive; nevertheless, one could still argue that the spontaneous incorporation of audio and visual materials actually depends more on having a computer and Internet access in the classroom than an IWB. For schools with limited budgets, computers and Internet access would therefore have to take priority over IWB installation, if a choice were necessary.

There is, however, one feature praised by participants in this study, which is truly unique to IWBs, namely, the ability to save materials produced during the conduct of the lesson. With traditional whiteboards, once the board is filled up it must be erased, and all the content on the board is lost. With the IWB, filled screens can be saved and then easily referred back to later in the lesson or later in the school year. This can include anything from texts and diagrams produced in class by either the teacher or the students, to items found during class and downloaded from the Internet. All of these can be neatly saved and stored for future reference. This feature is perhaps one of the reasons teachers point to an increased efficiency when teaching with IWBs and may explain to some extent the mixed responses to the question

about whether it takes longer to prepare lessons for IWB-based lessons over regular lessons. While it may take longer at first, the ability to easily collect and supplement teaching materials, and even to easily share them among colleagues, may gradually reduce the overall amount of time needed for preparation.

Another important issue, for which the participant teachers and students found IWBs to be useful, is that of motivation. Low student motivation is a frequently noted problem in EFL classrooms in Turkey, as it is in many other educational contexts. Similar to the findings of past studies on IWBs (e.g. Bell, 2002; Gray et al., 2005; Harris, 2005; Smith, 2001; Walker, 2002a), this study found that not only did teachers feel very strongly that their students were more motivated during IWB-based lessons, but the students themselves reported it as well. It is important to note that this high level of reported motivation and interest in IWB-based lessons was consistent among all groups of teachers and students, regardless of the degree of exposure to the technology. In other words, the excitement and motivation felt by those using an IWB for the first few times did not fade in those who had used one on many occasions. While obviously IWBs are not a panacea for dealing with students' lagging motivation, they do seem to offer a genuinely useful tool for addressing this common problem.

Turning to actual problems with the IWBs themselves, the findings here again reflected the earlier studies (e.g. Bell, 2001; Canterbury, 2003; Damcott et al., 2000; Hall & Higgins, 2005; Harris, 2005; Levy, 2002; Smith, 2001; Wood, 2001) – although, if anything, the participants in this study were slightly less critical. More than one half of the students agreed that there are sometimes conditions that make it difficult to see the IWB screen. On the other hand, a large number disagreed with this or reported not having any idea about such problems. In the various observed classrooms, this was not found to be a problem, as curtains on the windows prevented unnecessary shadows and sunlight from hitting the screen. Obviously, if an institution makes the decision to invest in this equipment, the additional small investment for curtains should not be overlooked. With respect to other problems, such as the screen freezing and requiring a time-consuming restarting of the IWB, participants in this study were moderately less critical than those in other studies, and again, no such problems were observed in the video-taped classes. As with any technological device in the classroom, it is important that the teacher is aware of the potential problems and has solutions at the ready in case such a problem should arise. For minor problems solved by turning the machine off and restarting, the teacher should have extra material on hand to be able to use with the students during the wait time. For major problems, the school should have a knowledgeable technician either on staff or within easy contact.

The other most commonly noted problem by teachers in earlier studies (e.g. Armstrong et al., 2005; Glover & Miller, 2001; Hall & Higgins, 2005; Levy, 2002) was the need for – and lack of – sufficient training to use the IWBs properly. Again, the teachers in this study were generally in agreement with this position, although perhaps a bit less insistent on the absolute need for training. While a relatively small majority did agree with the questionnaire item stating that some training was needed, on another question, barely half of the teachers felt that training was absolutely necessary for them to be able to use IWBs. We would add a cautionary note, however, for any administrator looking at this finding and thinking that perhaps expensive and time-consuming training is unnecessary. It seems likely that, with minimal or no training, many teachers with a familiarity with computers can make use of an IWB's basic functions. In such a situation though, there is the potential



that the teachers will fail to make use of the functions that truly distinguish IWBs from other technological tools. To reap the full benefits of IWBs, making the extra step in training those who will use it is essential. Only in that way is it likely that the IWBs will be used to their full extent.

### **Suggestions for further research**

This study investigated EFL students' and teachers' attitudes toward the use of IWBs in Turkey. Although the interpretations made in this study reflect some additional data gathered through interviews and observations, it is recommended that more classroom observations be carried out to investigate to what extent teachers really make use of the potentials of this technology as claimed in the literature. Such a study, if conducted in a longitudinal manner, could attempt to confirm the finding in this study that greater use relates to more positive attitudes. Moreover, given the importance of interaction for effective language learning settings, the particular focus of a classroom-based research study could be to look at whether and if so how IWB use contributes to classroom interaction specifically.

The effectiveness of this technology in language learning should also be examined. Although IWBs are claimed to have an impact on learning, this has not yet been confirmed. Future quasiexperimental studies should be conducted to investigate the real contributions of this technology in language learning settings. If significant contributions to learning are not found, administrators would clearly want to consider their options carefully before purchasing this expensive technology.

### **Conclusion**

The findings of this study revealed that, in Turkey, both students and teachers have positive attitudes toward IWB use in EFL classes. IWB-based lessons are perceived as more interesting and enjoyable, and in IWB-based English lessons, students are found to be more motivated and participate more in the classroom activities. Although technical problems can occur, they do not seem to overrule the broad impression that this technology is welcomed and appreciated by both students and teachers. While institutions considering investment in IWB technology can be reasonably confident that it will be greeted positively by teachers and students alike, the decision to purchase is still not one to be taken lightly. A sufficient number of IWBs need to be installed to allow adequate accessibility to all teachers and students in an institution. In relation with this, careful consideration of IWBs' various capacities and options must be made. Buying a greater quantity of IWBs but with fewer special features and less costly options may not be a good choice, as it reduces those very characteristics that make IWBs unique, and therefore worth investing in. Finally, for most effective and full use of this technology device, as with any other, teachers should have access to adequate training and should be provided with technical- and material-based support.

### **Note**

1. According to various news reports, the USA is the fastest growing market for IWBs (<http://www.ameinfo.com/209586.html>) even though the total number of US classrooms equipped with IWBs (12%) is still far fewer than in the UK (60%) (<http://www.edweek.org/dd/articles/2007/09/12/02board.h01.html>). Overall, the USA, UK, and

Mexico dominate the world market, with more than 70% of installed IWBs being in these three countries and the remaining 30% spread across more than 60 different countries. Future sales are expected to increase rapidly in the USA, Europe, the Middle East, Africa, and Asia, and it is projected that by 2010 one in six classrooms worldwide will be using IWBs see <http://displaydaily.com/2008/09/05/the-handwriting-on-the-interactive-whiteboard-seems-clear/>

### Notes on contributor

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### References

- Armstrong, V., Barnes, S., Sutherland, R., Curran, S., Mills, S., & Thompson, I. (2005). Collaborative research methods for investigating teaching and learning: The use of interactive whiteboard technology. *Educational Review*, 57(4), 457–469.
- Austin, N. (2003). Mighty white. *The Guardian*, January 7, 2003.
- Beauchamp, G. (2004). Teachers' use of the interactive whiteboard in primary schools. *Technology Pedagogy and Education*, 13(3), 327–348.
- Beeland, W.D. (2002). *Student engagement, visual learning and technology: Can interactive whiteboards help?* Retrieved November 5, 2009, from [http://chiron.valdosta.edu/are/Artmascript/vollno1/beeland\\_am.pdf](http://chiron.valdosta.edu/are/Artmascript/vollno1/beeland_am.pdf)
- Bell, M.A. (2001). *Update to survey of use of interactive electronic whiteboard in instruction*. Retrieved November 5, 2009, from [http://www.shsu.edu/~lis\\_mah/documents/updateboardindex.htm](http://www.shsu.edu/~lis_mah/documents/updateboardindex.htm)
- Bell, M.A. (2002). Why use an interactive whiteboard? A baker's dozen reasons! *Teachers.Net Gazette*. Retrieved November 5, 2009, from <http://teachers.net/gazette/JAN02/mabell.html>
- Billard, D. (2002). Interactive skeletons promote writing. *Literacy Today*, 30, 27–31.
- Boyle, J. (2002). Virtual magic. *Times Educational Supplement*, March 7, 2002.
- Canterbury Christ Church University College (Faculty Learning Technology Team). (2003). *Briefing paper on the application of interactive whiteboards to learning and teaching*. Canterbury Christ Church University College, Learning and Teaching Enhancement Unit.
- Carson, L. (2003). Board work, not boring. *Times Educational Supplement*, May 9, 2003.
- Damcott, D., Landato, J., & Marsh, C. (2000). *Report on the use of the smart board interactive whiteboard in physical science*. Retrieved November 5, 2009, from <http://www.smarterkids.org/research/paper3.asp>
- Edwards, J.A., Hartnell, M., & Martin, R. (2002). Interactive whiteboards: Some lessons from the classroom. *Micromaths*, 18, 30–33.
- Glover, D., & Miller, D. (2001). Running with technology: The pedagogic impact of the large scale introduction of interactive whiteboards in one secondary school. *Journal of Information Technology for Teacher Education*, 10, 257–276.
- Goodison, T. (2003). Integrating ICT in the classroom: A case study of two contrasting lessons. *British Journal of Educational Technology*, 34(5), 549–566.
- Gray, C., Hager-Vaughan, L., Pilkington, R., & Tomkins, S.A. (2005). The pros and cons of interactive whiteboards in relation to the key stage 3 strategy and framework. *Language Learning Journal*, 32(1), 38–44.
- Hall, I., & Higgins, S. (2005). Primary school students' perceptions of interactive whiteboards. *Journal of Computer Assisted Learning*, 21(2), 102–117.
- Harris, N. (2005). Interactive whiteboards: ELT's next big thing? *Modern English Teacher*, 14(2), 61–68.

- Hauck, M., & Youngs, B.L. (2008). Telecollaboration in multimodal environments: The impact on task design and learner interaction. *Computer Assisted Language Learning*, 21(2), 87–124.
- Johnson, C. (2002). The writing's on the board. *Educational Computing and Technology*, September, 58–59.
- Kennewell, S. (2001). Interactive whiteboards – yet another solution looking for a problem to solve. *Information Technology in Teacher Education*, 39, 3–6.
- Kennewell, S., Tanner, H., Jones, S., & Beauchamp, G. (2007). Analysing the use of interactive technology to implement interactive learning. *Learning, Media and Technology*, 24(1), 61–73.
- Latham, P. (2002). *Teaching and learning mathematics: The impact of interactive whiteboards – Results of the North Islington Education Action Zone RM Easiteach Mathematics Project*. London: BEAM Education.
- Lee, B., & Boyle, M. (2004). *Teachers tell their story: Interactive whiteboards at Richardson Primary School*. Retrieved November 5, 2009, from [www.iwb.net.au/advice/publications/documents/TeachersStory2.doc](http://www.iwb.net.au/advice/publications/documents/TeachersStory2.doc)
- Levy, P. (2002). Interactive whiteboards in learning and teaching in two Sheffield schools: A developmental study. Retrieved November 5, 2009, from <http://dis.shef.ac.uk/eirg/projects/wboards.htm>
- Martin, S. (2007). Interactive whiteboards and talking books: A new approach to teaching children to write? *Literacy*, 41(1), 26–34.
- Morrison, D. (2003). From chalkface to interface, the impact of the interactive whiteboard in the history of the classroom. Retrieved November 5, 2009, from <http://www.ngflscotland.gov.uk/nq/Chalkface.asp>
- Moss, G., Jewitt, C., Levaic, R., Armstrong, V., Cardini, A., & Castle, F. (2007). The interactive whiteboard, pedagogy and pupil performance evaluation. Retrieved November 5, 2009, from [www.dfes.gov.uk/research/data/uploadfiles/RR816.pdf](http://www.dfes.gov.uk/research/data/uploadfiles/RR816.pdf)
- Schmid, E.C. (2006). Investigating the use of interactive whiteboard technology in the English language classroom through the lens of a critical theory of technology. *Computer Assisted Language Learning: An International Journal*, 19(1), 47–62.
- Smith, A. (1999). *Interactive whiteboard evaluation*. Retrieved November 5, 2009, from <http://www.mirandanet.ac.uk/pubs/smartboards.htm>
- Smith, H. (2001). *Smartboard evaluation: Final report*. Retrieved November 5, 2009, from <http://www.kented.org.uk/ngfl/ict/IWB/whiteboards/report.html>
- Smith, H., Higgins, S., Wall, K., & Miller, J. (2005). Interactive whiteboards: Boon or bandwagon? A critical review of the literature. *Journal of Computer Assisted Learning*, 21(2), 91–101.
- Tameside MBC (2003). Interim report on practice using interactive whiteboards in Tameside primary schools. Retrieved November 5, 2009, from [http://www.tameside.gov.uk/schools\\_grid/ict/whiteboards.pdf](http://www.tameside.gov.uk/schools_grid/ict/whiteboards.pdf)
- Thomas, A. (2002). The white stuff. *Times Educational Supplement*, October 11, 2002.
- Tozcu, A. (2008). The use of interactive whiteboards in teaching non-Roman scripts. *Computer Assisted Language Learning*, 21(2), 143–166.
- Walker, D. (2002a). White enlightening. *Times Educational Supplement*, September 13, 2002.
- Walker, D. (2002b). Meet whiteboard Wendy. *Times Educational Supplement*, September 13, 2002.
- Wall, K., Higgins, S., & Smith, H. (2005). The visual helps me understand the complicated things: Pupil views of teaching and learning with interactive whiteboards. *British Journal of Educational Technology*, 36(5), 851–867.
- Wood, C. (2001). Interactive whiteboards: A luxury too far? *Teaching ICT*, 1(2), 52–62.